REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 13, 14 and 26-40 are in the case.

I. THE INTERVIEW

At the outset, the undersigned wishes to thank the Examiner (Ms. Elve) for kindly agreeing to conduct an interview in this case. The interview was held on October 21, 2008 and the courtesies extended by the Examiner were most appreciated. The substance of the interview will be clear from the comments presented below and from the comments appearing in the Interview Summary completed at the termination of the interview.

II. THE OBVIOUSNESS REJECTIONS

(a) The Rejections

Claims 13-14 and 37-40 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Deller *et al.* (USPN 5,166,120) (Deller) in view of Muller *et al.* (USPN 5,686,152) (Muller). Claims 26-36 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Shiozaki *et al.* (USPN 4,366,093) (Shiozaki) in view of Eichhorn *et al.* (USPN 4,740,644) (Eichhorn). The rejections are respectfully traversed.

(b) The Claims

As discussed during the interview, the invention of claim 13 provides catalyst support for selective gas phase reactions in a tubular fixed bed reactor, comprising a **metallic** monolith having channels with walls. The channel walls are for receiving a

catalytically active phase or an intermediate layer carrying a catalytically active phase, and the surface area per unit volume of the monolith is at least 6 cm^2/cm^3. As the monolith is metallic, heat of reaction in an exothermic reaction is **removed by the metallic monolith thereby reducing hot spots.**

Method claims 26 and 34 provide method claims directed, respectively, to the use of the metallic monolith of the invention in exothermic and endothermic reactions. Thus, method claim 26 provides a method for selectively reacting reagents in a gas phase exothermic reaction, by reacting the reagents in a tubular fixed bed reactor comprising a metallic monolith having channels with walls carrying a catalytically active phase or an intermediate layer carrying a catalytically active phase. The catalytically active phase catalyses a selective exothermic gas phase reaction, and the heat of reaction in the exothermic reaction is removed by the metallic monolith, thereby reducing hot spots. Method claim 34 provides a method for selectively reacting reagents in a gas phase endothermic reaction in which the catalytically active phase catalyses a selective endothermic gas phase reaction, and the heat of reaction in the endothermic reaction is provided from the walls of the tubular reactor by the metallic monolith, thereby reducing cold spots.

As explained at the interview, an important element of the present invention is the use of catalyst supports based on **metallic** monoliths as opposed to the prior art ceramic monoliths. According to the present invention, metallic supports are particularly advantageous in exothermic and endothermic reactions. A number of advantages of the invention are listed in the application as originally filed at paragraph [0025], and include:

- Improved properties with respect to heat production and hot-spots;
- Slower catalyst deactivation;
- Higher reaction purity and selectivity;
- Improved pressure properties;
- The possibility of using larger diameter reaction tubes (which may ultimately lead to lower cost); and
- The possibility of using single reactors and single reactor feed points as opposed to multi-reactor systems and multiple feed inlets.

(c) **The Prior Art**

The Action asserts that:

"The types of materials and dimensions chosen are a choice in design and substitutions of known equivalent structures may be made. *In re* Kuhle 188 USPQ(CCPA 1975), *In re* Ruff 118 USPQ 343 (CCPA 1958)."

Applicants disagree. Deller is silent on anything which could be considered "a monolith having channels", silent on a carrier being made of **metal** and silent on the surface area per unit volume of the carrier. Deller fails to suggest anything other than alumina for the carrier material.

The catalyst of Muller is similarly based on a ceramic material, namely gamma or alpha alumina support material (see, part (d) of the structure), i.e., **not** a metallic support. Muller describes a number of different internal structures which can result in more than one channel through the centre of the pellet, and "monolith shaped bodies"

are mentioned (see, for example, col. 8, lines 1 to 9). However, Muller, like Deller, fails to describe or suggest the use of a **metallic** structure, as presently claimed. Thus, the combination of Deller and Muller does not suggest the use of **metallic** structures.

Referring to the second obviousness rejection, Shiozaki describes the potential use of pellets as catalyst supports for fixed bed processes and reactions, and Eichhorn describes the preparation of 1,2-dichloroethane by oxychlorination of ethylene over a copper-containing catalyst impregnated "on a conventional carrier" (col. 3, lines 33-34) without elaboration. There is no suggestion in these references of metallic monoliths with channels.

The assertion in the Action that the types of materials and dimensions chosen "are a choice in design and substitutions of known equivalent structures may be made", is unsupported by evidence. There is nothing to suggest that annular **ceramic** carriers would be considered by one of ordinary skill as equivalent structures to **metallic** monoliths having channels. The fact that **only ceramic** support materials are discussed in Deller, Muller, Shiozaki or Eichhorn supports this position.

In light of the above, it is clear that the cited art does not give rise to a *prima facie* case of obviousness of the presently claimed invention. Withdrawal of the obviousness rejections is respectfully requested.

III CLAIM AMENDMENTS

During the interview, it was agreed that the claims would be improved by clarifying that the walls of the channels are for receiving a catalytically active phase or an intermediate layer which itself carries a catalytically active phase. Those

amendments have been made. In addition, it was agreed that the original language "walls ....adapted to receive" should be replaced by "walls for receiving...". These amendments have been made in claims 13, 26 and 34. The claims have also been amended to clarify an important property associated with the **metallic** monoliths namely that, in the case of an exothermic reaction, the heat of reaction is removed by the metallic monolith thereby reducing hot spots (claim 13) and, in the case of an endothermic reaction, the heat of reaction is provided from the walls of the tubular reactor by the metallic monolith, thereby reducing cold spots. Support for the amendments appears, for example, at page 4, lines 6-8 which refers to the efficient removal of heat of reaction and the substantial avoidance of hot spots, and at page 2, lines 15-18 which refers to the difficulties encountered with endothermic reactions and the resulting formation of cold spots. No new matter is entered.

Favorable action is awaited.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By: _____
Leonard C. Mitchard
Reg. No. 29,009

LCM:lff
901 North Glebe Road, 11th Floor
Arlington, VA 22203-1808
Telephone: (703) 816-4000
Facsimile: (703) 816-4100